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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/905,286	07/13/2001	Cem Basceri	MI22-1724	3892

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EXAMINER

FULLER, ERIC B

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 12/19/2001

4

Please find below and/or attached an Office communication concerning this application or proceeding.

MF-4

Office Action Summary

Application N .

09/905,286

Applicant(s)

BASCERI ET AL.

Examiner

Eric B Fuller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,3 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6-9, and 11-24 are rejected under 35 U.S.C. 102(b) as being anticipated by DiMeo, Jr. et al. (US 5,972,430).

DiMeo teaches a CVD process for producing multi-component oxide layers. Example 4 shows that this is done by providing a substrate into the reaction chamber and flowing barium, strontium, and titanium precursors to the substrate (column 12, lines 4-8). The temperature of the substrate is 500 degrees Celsius (column 13, line 65), which implies that the susceptor would be below the applicant's claimed 550 degrees Celsius. An oxidant stream is then flowed over the substrate in order to oxidize the precursor layer (column 12, line 19), thus producing a BST layer. Although this example indicates oxygen and nitrous oxide as the oxidants, it is taught that the suitable oxidants include oxygen, ozone, nitrous oxide, nitric oxide, nitrogen dioxide, water vapor, hydrogen peroxide vapor, and mixtures thereof (column 9, lines 5-8). These possible oxidants read on all the oxidation gas mixtures that the applicant has claimed. Furthermore, since no steps have been taken to alter the concentration of the deposited layer, it is assumed to be homogenous (pertinent to applicant's claims 4 and 9).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over DiMeo, Jr. et al. (US 5,972,430) as applied to claims 1 and 6 above, and further in view of Kang (US 6,127,218).

DiMeo teaches the process of producing a precursor layer then oxidizing it with an oxidant stream. This process can be repeated until a final thickness is achieved (figure 1). DiMeo is silent on producing a BST that is not homogenous. However, Kang teaches a process wherein by adjusting the oxidant stream, it is possible to adjust the composition of the BST film. By having multiple layers of differing composition, the dielectric constants are increased and the leakage currents are decreased (column 2, lines 45-50). These trends are desirable for ferroelectric films. The process taught by Kang applies all streams simultaneously, while DiMeo teaches the precursor and oxidant streams being applied separately. However, it still would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the concept of altering the oxidation stream, as taught by Kang, in the process taught by DiMeo, such that the BST film deposited will vary in composition. One skilled in the art would realize that each repeated step of DiMeo could have a different oxidation mixture,

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resulting in a multi-layered BST film of varied composition with controlled thickness. Doing this would increase the dielectric constant of the film and reduce the leakage current, making for a better ferroelectric film.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Staus et al. (US 6,277,436 B1) teaches a continuous process wherein the oxidant stream is oxygen, ozone, nitrous oxide, or the like (and mixtures thereof). "And the like" would be deemed to include the hydrogen peroxide and water vapors, as it is shown in DiMeo that they are all oxidants.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B Fuller whose telephone number is (703) 308-6544. The examiner can normally be reached on Tuesday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-5408 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

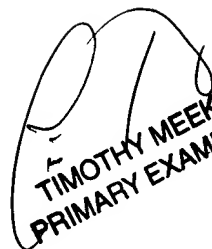
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Eric B Fuller

December 14, 2001


TIMOTHY MEEKS
PRIMARY EXAMINER